IN THE CLAIMS

1. (Currently amended) An apparatus comprising:

one or more processors; and

a memory coupled to the processors comprising instructions executable by the processors, the processors operable when executing the instructions to:

identify [[a]] an inputted reference failure rate for a monitored device, the inputted reference failure rate being a first quotient of an amount of failures associated with a population of the monitored device and an amount of time, the inputted reference failure rate associated with an expected operating temperature for the monitored device and an expected communication capacity utilization ~~traffic-based stress ratio~~ for the device;

communicate with the monitored device while the monitored device is in field operation for determining an actual operating temperature for the monitored device and an actual communication capacity utilization ~~traffic-based stress ratio~~;

determine a temperature stress adjustment factor using the expected operating temperature and the actual operating temperature;

determine an electrical stress adjustment factor using the expected communication capacity utilization ~~traffic-based stress ratio~~ and the actual communication capacity utilization ~~traffic-based stress ratio~~; and

output an instantaneous failure rate that is a first mathematical product of the inputted reference failure rate, the temperature stress adjustment factor and the electrical stress adjustment factor.

2. (Previously presented) The apparatus of claim 1 wherein determining the temperature stress adjustment factor further includes determining a difference of a first reciprocal of the expected operating temperature and a second reciprocal of the actual operating temperature.

3. (Previously presented) The apparatus of claim 2 wherein the processors are further operable to determine the temperature stress adjustment factor further includes by

calculating a second mathematical product of the difference and a second quotient of a predetermined thermal activation energy for the monitored device and Boltzmann's constant

4. (Currently amended) The apparatus of claim 1 wherein the processors are further operable to determine the electrical stress adjustment factor by calculating a difference of the expected communication capacity utilization ~~traffic-based-stress-ratio~~ and the actual communication capacity utilization. ~~traffic-based-stress-ratio~~

5. (Previously presented) The apparatus of claim 4 wherein the processors are further operable to determine the electrical stress adjustment factor by calculating a second mathematical product of the difference and a predetermined electrical stress characteristic of the monitored device.

6. (Currently amended) The apparatus of claim 1 wherein the apparatus integrated with a router and the monitored device is a communication component ~~line card~~ located in the router ~~a same network device that contains the apparatus~~.

7. (Previously presented) The apparatus of claim 1 wherein the instantaneous failure rate for the monitored device is outputted to a display device.

8. (Currently amended) The apparatus of claim 6 [[1]] wherein ~~the monitored device is a line card located in a network device and~~ the outputted instantaneous failure rate corresponds to the communication component ~~line card~~.

9. (Currently amended) The apparatus of claim 8 wherein the processors are further operable to use the instantaneous failure rate for the communication component ~~line card~~ to determine an instantaneous failure rate for the router ~~network device~~.

10. (Currently amended) The apparatus of claim 1 wherein the processors are further operable to:

check the integrity of non volatile memory used to store the inputted reference failure rate, the expected operating temperature and the expected communication capacity utilization ~~traffic-based stress ratio~~;

initialize random access memory (RAM) with previously stored values;

define a reliability sampling period or interval; and

start background tasks.

11. (Previously presented) The apparatus of claim 1 wherein the monitored device is located remotely with respect to the apparatus and the apparatus is operable to communicate with the monitored device over a network.

12. (Currently amended) The apparatus of claim 1 wherein the processors are further operable to communicate with a traffic byte counter coupled to the monitored device to determine the actual communication capacity utilization ~~traffic-based stress ratio~~ that is a second quotient of a traffic-byte-counter-measured packet processing rate for the monitored device and a theoretical maximum packet processing rate for the monitored device.

13. (Previously presented) The apparatus of claim 1 wherein the processors are further operable to determine a cumulative reliability indication value by summing the instantaneous failure rate with other instantaneous failure rates for the monitored device that are determined by the apparatus periodically according to a predefined period.

14. (Currently amended) A system comprising:

means for inputting ~~identifying~~ a first predetermined Mean Time Between Failures (MTBF) ~~reference failure rate~~ for a monitored device, the first predetermined MTBF ~~reference failure rate~~ based on expected environmental conditions and expected usage parameters for the device;

means for measuring actual temperature while the device is being operated in the field ~~by a purchaser of the monitored device~~ and actual electrical stress on the monitored device while the device is being operated in the field ~~by a purchaser of the device~~;

means for determining a second field-adjusted MTBF for the monitored device, the second field-adjusted MTBF determined by adjusting the first predetermined MTBF by the field-measured actual temperature and the field-measured actual electrical stress, the second field-adjusted MTBF being different than the first predetermined MTBF; and

~~means for comparing the expected environmental conditions and the expected usage parameters to the measured actual temperature and the measured actual electrical stress;~~

~~means for determining an instantaneous failure rate by adjusting the reference failure rate according to the comparison; and~~

means for outputting the second field-adjusted Mean Time Between Failures (MTBF) ~~the determined instantaneous failure rate~~.

15. (Currently amended) The system of Claim 14 wherein the measurements of the actual temperature and the actual electrical stress are initiated ~~measured~~ automatically after passage of a predefined time interval.

16. (Previously presented) The system of Claim 15 wherein the measurements are taken over a predefined duration.

17. (Currently amended) The system of Claim 14 further comprising:

means for determining an instantaneous failure rate by adjusting a reference failure rate for the device according to measurements;

means for automatically re-determining the instantaneous failure rate after passage of a predefined time interval; and

means for the identifying a cumulative reliability indication value for the monitored device by summing the initial instantaneous failure rate and the re-determined instantaneous failure rate.

18. (Previously presented) The system of Claim 14 wherein the expected environmental conditions include expected operating humidity and expected operating ambient temperature.

19. (Previously presented) The system of Claim 14 wherein the expected usage parameters are based on an expected amount of power cycles applied to the monitored device.

20. (Previously presented) The system of Claim 14 wherein the expected temperature is an expected operating temperature.

21. (Previously presented) The system of Claim 14 wherein the expected temperature is an expected ambient temperature.

22. (Previously presented) A computer readable medium with instructions embedded therein for causing a processor implement a reliability determination process including:

an initialization module for directing implementation of an initialization process;

determination process and a field condition reliability analysis process for determining one or more operational parameters of a component;

a reliability determination runtime module for interfacing with an operating system to calculate one or more field-adjusted Mean Time Between Failures (MTBFs) by adjusting a reference MTBF for the component using the operational parameters and to calculate one or more cumulative reliability index values based on the field-adjusted MTBFs; and

an output module for causing the calculated cumulative reliability index values to be displayed to a user.

23. (Previously presented) A computer readable medium of Claim 22 wherein said initialization module includes instructions for:

checking the integrity of non volatile memory;

initializing random access memory (RAM) with previously stored values;

defining a reliability sampling period or interval; and

a background module for starting background tasks.

24. (Previously presented) A computer readable medium of Claim 23 wherein said background module includes instructions for implementing reliability associated firmware activities.

25. (Previously presented) A computer readable medium of Claim 23 wherein said background module divides background tasks into multiple background threads that operate separately.

26. (Cancelled)

27. (Currently amended) A method comprising:

identifying a reference failure rate for a device, the reference failure rate usable for calculating a time between failures statistic associated with the device and based on expected operating parameters for the device;

measuring actual operating parameters for the device while the device is operated for non-testing purposes in a field environment for the device;

determining a custom failure rate by adjusting the reference failure rate that is based on the expected operating parameters and based on the actual operating parameters by the actual operating parameters that are measured while the device is operated for non-testing purposes in the field environment; ~~and~~

outputting a signal for displaying the custom failure rate[[.]]; and

outputting a field-adjusted Mean Time Between Failures (MTBF) for the device that is determined by adjusting a predetermined MTBF for the device using the actual operating parameters that are measured while the device is operated for non-testing purposes in the field environment.

28. (Previously presented) The method of claim 27 wherein the measured operating parameters are transferred over a network for remote analysis.

29. (Currently amended) The method of claim 27 wherein the device is a communication component located in a router ~~line card located in a network processing element~~.

30. (Previously presented) The method of claim 27 wherein the custom failure rate is an instantaneous failure rate for the device measured at a first time and the custom failure rate

is summed with other instantaneous failure rates for the device that are measured at second other times to generate a cumulative reliability indication.

31. (Previously presented) The apparatus of claim 1 wherein the processors are further operable to output a field-adjusted Mean Time Between Failures (MTBF) for the monitored device that is determined by adjusting a predetermined MTBF for the monitored device using the actual operating parameters that are measured while the monitored device is used for non-testing purposes in the field environment.

32-33. (Cancelled)

34. (Currently amended) The method of claim 27 wherein measuring actual operating parameters includes monitoring a communication capacity utilization ~~transistor utilization percentage~~ for the device.

35. (Currently amended) The method of claim 27 wherein measuring actual operating parameters includes monitoring a communication capacity utilization ~~bandwidth usage percentage~~ for the device.

36. (Currently amended) The apparatus of claim 1 ~~method of claim 27~~ wherein the outputted instantaneous ~~reference~~ failure rate ~~for the device~~ is associated with a Mean Time Between Failures (MTBF) ~~a reciprocal of a reference MTBF~~ for the monitored device.